Federal Reserve Bank – Seattle, WA

1015 Second Ave.
Seattle, WA

Elevator Report

March 17, 2014

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Executive Summary

A. Overview

On March 7, 2014, James Young of Architectural Elevator Consulting, LLC (AEC) performed a site visit at The Federal Reserve Bank of San Francisco, Seattle, WA. The purpose of the visit was to evaluate longevity of the major components of the elevators and develop a 10 year capital investment plan. The building has been used as a branch office of the Federal Reserve Bank of San Francisco, but current plans are to convert the building to a facility that will provide services to the homeless.

The vertical transportation system consists of five (5) traction elevators. There are three passenger elevators and two (2) freight elevators. Elevators 1-2, and 4-5 were originally furnished and installed by Otis. Elevator 3 appears to have been installed in the 1970s, also by Otis. In the late 1990s a major modernization was performed by ThyssenKrupp Elevator (TKE) on the passenger elevators 1 and 2. The modernization work completed by TKE was extensive and included new Dover Traflomatic IV (TIV) controllers, SCR drives, new door operators and all new signal fixtures. Both of these cars were turned off and not running so a full survey and performance review was not completed, but it appears that these elevators will not need any major capital upgrades for the next 10 years.

Most of the State of Washington retro-active codes required by WAC 296-96 are up-to-date. The elevators meet ADA size requirements for existing installations and have the proper gongs and floor passing chimes. The elevators are located in a seismic zone, but were installed prior to the State adopting A17.1 2004 seismic code. However, when they were modernized in 1998 seismic derailment devices were added to the counterweight rails.

B. Elevator Layout

Passenger elevators 1, 2 and 3 are lined up in a row, but are not interfaced together. Elevators 1 and 2 are grouped together and operate as a duplex system. Elevator 3 operates at a much slower speed and as a single car. This layout is undesirable because it gives users the opportunity to call either group, or both groups of elevators when waiting. In addition to the three passenger elevators there are two freight elevators. Freight elevator #4 has power operated doors while Freight elevator #5 has manually operated doors. When the building is converted to use as a homeless support center, the two passenger elevators will most likely provide most of the elevator service needed. The third passenger elevator, Car 3 should either be removed or modernized. If modernized it should be tied into passenger cars 1 and 2 so they operate together as a three car group. This would entail extensive work.

	Federal Reserve Bank – SF – Seattle, Branch			
Bank	Cars 1 and 2	Car 3	Car 4	Car 5
Type	Gearless Passenger	Geared Passenger	Geared Freight	Geared Freight
Capacity (LBS)	2,500[(1)]	2,500	4,000	4,000
Speed (FPM)	400 to 500[(2)]	100	200	?
Floors Served	B,G, 1-4	B,M,1-2	B,G, 1-4	B, G, 1
Operation	Duplex	Simplex	Simplex	Simplex
Door Type	Center Opening	Center Opening	Vertical bi-parting	Vertical bi-parting
Quantity	Two	One	One	One
Date installed	1956	1956	1956	1956
Modernized	Yes – 1990s	No	No	No

(1) Access to the cab interiors was limited, the capacity listed above is based on the size of the cab size for Car 1. (Car 2 was never accessed, as it was shut off for unknown reasons.)
(2) The rated speeds of Cars 1 and 2 are estimated to be 400 FPM to 500 FPM based on the gearless design.

C. Capital Upgrades/Major Components:

The majority of the components for passenger Cars 1 and 2 are newer and appear to be in good condition, but neither elevator was running at the time of our survey. The modernization included new controllers, SCR drives, governors, signal fixtures and door equipment. The major components for Car 3 are all original and should be modernized or the elevator removed. If modernized, it should be interfaced with Cars 1 and 2 so they all operate together as a three car group. Freight car 4 has fully automatic doors and had some upgrades added in the last 15 years such as new door equipment and new signal fixtures. Most of the control equipment however is original.

In ***Section II*** of our report we have provided budget pricing for a base modernization with pricing for optional items.

D. Americans with Disability ACT (ADA):

In 1990 the federal government enacted ADA to make public spaces more accessible to disabled persons. Passenger elevators 1 and 2 appear to meet the requirements of ADA, but because they were not operating this could not be confirmed. Passenger elevator 3 does not meet ADA and will need a full modernization to meet ADA. The size of all three passenger elevators meet ADA size requirements for existing elevators and is within a few inches of meeting minimum size requirements for new elevators. Freight elevators 4 and 5 do not meet ADA, nor are they required to as they are for freight use only and must be operated by authorized elevator personnel. ***Appendix A*** provides a complete listing of the ADA requirements.

E. Retro-active Code Requirements: SBC, WAC 296-96 and A17.3

All elevators in the City of Seattle are required to comply with retro-active sections of WAC 296-96 – Part D and City of Seattle Chapter 30. In addition when they are modernized they are to comply with A17.3, the national retro-active safety code for existing elevators. A17.3 is published by the American Society of Mechanical Engineers and is enforced in most states but not adopted in the State of Washington or City of Seattle. A17.3 requires all elevators, no matter age or installation date, to meet a minimum level of safety. There are several items that do not meet A17.3 and they are listed below. In ***Appendix B*** there is a complete listing of City of Seattle, WAC 296-96 and A17.3 items. Below is a summary of the major items that do not comply:

Retro Active Safety Code Requirements				
No.	**Item**	**Unit Cost**	**Number of Units**	**Total**
1	Convert stop switch to keyed in Car 3	$500.00	1	$500.00
2	Add hand rails on top of cars. (Chapter 30)	$1,500.00	4	$6,000.00
3	Adjust door restrictors for Car 3	$3,500	1	$3,500.00
			Total	**$10,000.00**

F. Seismic Upgrades:

When elevators 1 and 2 were modernized a seismic switch was added to the pit and ring and string derailment was added to the counterweights. The remaining three elevators do not appear to have any seismic upgrades added over the years. When Car 3 is modernized, as we recommend the budget price we have provided includes minimal seismic upgrades such as adding a seismic switch and ring and string detection. We have also provided optional pricing to upgrade Cars 1, 2 and 3 to full compliance for current seismic code which would include new rail splices and brackets.

G. Energy Savings:

One of the small side benefits of modernizing the elevators is to achieve energy savings. Because of the low cost of energy in the Northwest any energy savings will be very small relative to the buildings overall energy consumption. However, the following energy savings options should be considered when modernizing this type of control system and they are as follows:

1. **Upgrade Car 3 with new MRL - AC Gearless Machine:** Under this option the existing geared machine for Car 3 would be removed along with the AC hoist motor. A new smaller gearless machine with a permanent magnet AC motor would be provided. The new machine would be much smaller than the existing and installed in the machine room. The new controller would come with an AC variable frequency drive and for added cost could have regenerative capability. This option would provide the highest level of energy savings but also the highest cost. If the incremental cost of the machine is not to great this would be the best option. Elevators 1 and 2 could be modernized with the same type of machines, but because there is still several years of useful life left on those controllers a modernization to achieve small energy savings is not recommended. It is important to note that when elevators 1 and 2 were modernized in the 1990's they had energy savings SCR drives added, thus the energy savings when modernizing those elevators again would be minimal.
2. **Cab Lighting & Cab Fans:** The cab interior lights could be upgraded with energy efficient LED light fixtures. Along with the LED upgrade the lights could be programmed to time out after 5- 10 minutes of no use. The exhaust fans on each car could also be timed out along with the lights.
3. **Hoistway Vents:** Each hoistway appears to have a hoistway vent that is fixed open. Recently Washington State energy code required that all new elevators with hoistway vents have motorized dampers that keep the vents normally closed and keep the hot air in. Upon fire alarm activation and/or loss of power the vents will open automatically to prevent the accumulation of smoke. The City of Seattle does not retroactively require motorized dampers be added on a typical modernization, but because the use of the building is changing they may require it. This upgrade is recommended regardless of whether the City will require it or not, because the payback from energy savings is 2-3 years.

H. Summary

Passenger elevators 1 and 2 had a full modernization in the late 1990s and no major work is anticipated in the next 5 to 10 years. However, neither car was operational, thus we recommended budgeting to do some pre-maintenance when taking over the building. Passenger elevator 3 should be fully modernized or removed. If modernized, consideration should be given to interface this elevator with passenger Cars 1 and 2, as any elevators that are located near each other should

be tied together, otherwise users can call both sets of elevators and will create “ghost calls” which can deteriorate service. Freight elevator 4 could be used as is, but based on the new use of the building consideration should be given to convert this elevator to a fully automatic service elevator. Freight elevators are not allowed to transport passengers. If this elevator is converted to a service elevator then it would be easier to use. Elevator #5 does not appear to be needed and can be removed.

Vertical Transporation

Item No.	Recommendation	Rating	Quantity	Unit	Unit Cost	Immediate (0 - 6 months)	Year 1 2014	Year 2 2015	Year 3 2016	Year 4 2017	Year 5 2018	Year 6 2019	Year 7 2020	Year 8 2021	Year 9 2022	Year 10 2023	Totals	
1	Modernize passenger Car 3	4	1	EA	$275,000.00		$275,000										$275,000	
2	Interface Car 3 with Cars 1 and 2	4	2	EA	$60,000		$120,000										$120,000	
3	Modernize Freight Car 4 (Convert to Service)	4	1	EA	$250,000			$250,000									$250,000	
4	Remove Car 5	3	1	EA	$45,000	$45,000											$45,000	
5	Install car top handrails on Cars 1,2,3 and 5	1	4	EA	$1,500	$6,000											$6,000	
6	Install door restrictors on Car 3	1	1	EA	$3,500.00	$3,500											$3,500	
7	Install motorized dampers on hoistway vents	3	4	EA	$7,500.00		$30,000										$30,000	
8	Pre-maintenance repairs on Cars 1-2. (If we can get these turned on this week and review them when operational we may be able to remove this cost.)	2	2	EA	$7,500.00	$15,000												
9	Voluntarily upgrade guide rails on Cars 1-3 to full seismic compliance.	3	3	EA	$40,000					$120,000							$120,000	
	Subtotal					$69,500	$425,000	$250,000	$0	$120,000	$0	$0	$0	$0	$0	$0	$864,500	

1	$9,500	Code and Safety
2	$15,000	Deffered Maintenance & Repair
3	$195,000	Capital Expenditure
4	$645,000	Modernization / Improvements
5	$864,500	Other Cost Considerations

Rating:
1 - Code and Safety
2 - Repair and Maintenance
3 - Capital Expenditure
4 - Modernization / Improvements
5 - Other

Appendix "A"

ADA Checklist for Elevators

		Complies (Y/N)	
ADA	**Item**	**Cars 1 & 2**	**Car 3**
	GENERAL		
4.10.1	Elevator must comply with ASME A17.1-1990. Freight elevators are not acceptable unless only elevator provided, and is permitted to carry passengers, both public and employees.	Yes	Yes
	AUTOMATIC OPERATION		
4.10.2	Elevators must be Automatic.	Yes	Yes
4.10.2	Self-leveling to within 1/2 in.	Yes	Yes
	HALL CALL BUTTONS		
4.10.3	Buttons centered at 36-48 in. above the floor.	Yes	**No-52"**
4.10.3	Buttons to illuminate when call is entered and extinguish when answered.	Yes	**No**
4.10.3	Buttons to be at least 3/4 in. in the smallest dimension.	Yes	Yes
4.10.3	Up button located above down button.	Yes	Yes
4.10.3	Buttons raised or flushed.	Yes – raised	Yes – raised
4.10.3	Objects mounted beneath hall buttons not to project into the lobby more than 4 in.	None	None
	HALL or CAR LANTERNS		
4.10.4	Visible and audible signals at each hoistway entrance to indicate which car is responding to the call.	Yes - Hall	**None**
4.10.4	Audible signals to sound once for up and twice for "down" or may verbal announcement stating "up" "down."	DNC	-
4.10.4	Hall directional lantern centered 72 in. above floor.	Yes	-
4.10.4	Directional lantern visible elements minimum of 2-½ in. in the smallest dimension.	Yes - 2½"	-
4.10.4	Directional lanterns must be visible from the vicinity of the hall call button.	Yes	-
4.10.4	In car lanterns, meeting the requirements above are acceptable in lieu of hall directional lanterns.	N/A	-
	HOISTWAY ENTRANCES		
4.10.5	Raised and Braille floor designations are required on both door jambs. Permanently applied plates are acceptable.	Yes	**None**
4.10.5	Centerline of floor designation characters 60 in. above floor.	Yes	-
4.30.4	Characters must be 2 in. high, raised 1/32 in. upper sans serif (block letters) or simple serif type.	Yes	-
4.30.4	Grade II Braille to accompany raised characters.	Yes	-
	DOOR PROTECTIVE & REOPENING DEVICES		
4.10.6	Doors must open and close automatically.	Yes	Yes
4.1.6(3)(c)	If safety edges are provided on existing elevators, the non-contact door reopening devices may be omitted.	Yes	**No**

4.10.6	Reopening device to remain operational for at least 20 seconds.	Yes	**None**
	DOOR AND SIGNAL TIMING		
4.10.7	Minimum acceptable door open time from notification car is answering a hall call until the car doors begin to close: *T=D/(1.5ft/s,* where *T* is the total time in and *D* is the distance from a point in the lobby or corridor 60 in. directly in front of the farthest button controlling that car to centerline of its hoistway door.	DNC	**No**
4.10.7	Minimum acceptable notification time 5.0 seconds.	DNC	**No**
	DOOR DELAY FOR CAR CALLS		
4.10.8	Doors to remain open for a minimum of 3.0 seconds in response to car calls.	DNC	Yes
	FLOOR PLAN NEW ELEVATOR		
4.10.9	At least 36" wide door. Side Open Door: Cab must be 5'-8" wide x 4'-3" deep Center Open Door: Cab must be 6'-8" wide by 4'-3" deep	**No**	**No**
	FLOOR PLAN EXISTING ELEVATOR		
4.1.6	Minimum of 48" x 48"	Yes	Yes
4.10.9	Clearance between car platform sill and edge of hoistway landing sill no greater than 1-¼ in.	Yes	**No1 5/8"**
	Handrails Circular Square Dia.____Top of Handrail _____ Height Side Back	Yes – 34"	**None**
	FLOOR SURFACES		
4.10.10	Surfaces to be stable, firm and slip resistant.	Yes	Yes
4.5.3	Carpeting if installed must have firm cushion, pad or backing, or no cushion or pad. Carpeting must have level loop, textured loop, level pile texture. Carpeting pile thickness not to exceed 1/2 in. Carpeting must have exposed edges fastened to the floor surface. Exposed edges of carpets must be trimmed.	Yes	Yes
	ILLUMINATION LEVELS		
4.10.11	Five foot-candles of illumination to be provided at car controls, platform and at sill.	Yes	Yes
	CAR CONTROLS		
4.10.12	Buttons to be at least 3/4 in. in their smallest dimension.	Yes – 1"	Yes
4.10.12	Buttons must be flush or raised.	Yes - raised	Yes - raised
4.10.12	Buttons must be designated by raised characters and Braille or symbols complying with ASME A17.1 Rule 210.13.	Yes	**No**
4.10.12	Characters must be a minimum of 5/8 in. high, upper case sans (block letters) or simple serif type.	Yes	**No**
4.10.12	Grade II Braille to accompany raised character of symbol.	Yes	**No**
4.10.12	Raised designations must be to the immediate left of the button to which they apply.	Yes	**No**
4.10.12	Call button illuminates when call is entered and extinguish when answered.	Yes	**No**
4.10.12	Floor buttons must be no higher than 48 in. when located in front return. Buttons must be no higher than 54 in. when a side approach provided.	Yes-39 ¾"	**No-55 ½"**

4.10.12	Emergency controls, including emergency alarm and emergency stop (if provided) must be grouped at the bottom of the panel and have centerlines no less than 35 in. above the finished floor.	Yes – 35"	**No -58 ½"**
4.10.12	Controls must be on the front return wall with center-opening doors. They may be on the front return or strike jamb sidewall with side doors.	Yes - Front	Yes- Front
	CAR POSITION INDICATORS		
4.10.13	Visual car position indicator must be provided above control panel or over door.	Yes	**No**
4.10.13	Car position indicator numerals must be a minimum of 1/2 in. high.	Yes – 2 ½"	-
4.10.13	Audible signal to sound as the car passes or stops at a floor and a corresponding floor designation must illuminate. Audible signal must be at least 20 dB with a frequency no higher than 1,500 Hz.	DNC	-
4.10.13	A button to activate audible signal only for desired trip may be provided.	N/A	-
4.10.13	An automatic verbal announcement the floor at which a car stops may be substituted for the audible signal.	N/A	-
	EMERGENCY COMMUNICATIONS		
4.10.14	If provided, emergency two-way communication systems between the elevator and a point outside the hoistway must comply with ASME A17.1-1990, Rule 211.1.	Yes	Yes
4.10.14	The highest operable part must be a maximum of 48 in. from the car floor.	Yes – 21"	Yes-34 ½"
4.10.14	Emergency communication identification must be provided and located adjacent to the device. Characters must be a minimum of 5/8 in. high raised 1/32 in., upper case serif (block letters) or simple serif type, and accompanied by Grade II Braille.	**No**	Yes
4.10.13	If a handset is provided the cord must be at least 29 in. long.	N/A	N/A
4.27.4	If located in a closed compartment, the door must be operable with one hand. It must not require tight grasping, pinching or twisting of the wrist. The force required to open the door must not exceed 5 lb/f.	N/A	N/A
4.10.13	The system must not require voice communication.	**No**	**No**

Appendix "B"

A17.3, WAC 296-96, & SBC 3011
Code for Existing Traction Elevators

A17.3	WAC 296-96		Complies Yes/No			
			Cars 1 & 2	Car 3	Car 4	Car 5
N/A	**23100**	**Key Box:** Must have machine room keys and all other keys in a lock box labeled "elevator".	Yes	Yes	Yes	**No**
2.1		**HOISTWAYS**				
2.1.1	23110	Hoistway Construction (Enclosed & Fire rated per local code or ANSI/NFPA No. 101)	DNC	Yes	Yes	Yes
2.1.2	23111	Windows in Hoistway Enclosures: (If provided are they guarded properly.)	DNC	Yes	Yes	Yes
2.1.3	N/A	Projections in Hoistway (Must be flush and level; Leveling zone +3"./ 60 to 75 deg bevel.)	DNC	Yes	Yes	Yes
2.1.4	23113	Pipes Conveying Gases, Vapors, or Liquids. (If provided must be properly covered & securely fastened.)	DNC	Yes	Yes	Yes
N/A	23115	Safety requirements for inspecting overhead sheaves (proper decks and guard rails are required)	Yes	Yes	Yes	Yes
N/A	23116	Car Numbers: (If more than one elevator must have numbers in lobby, in car, machine, disconnect, etc.)	Yes	**No**	**No**	**No**
N/A	23117	Top of Car Railings: Required if over 12" space	**No**	**No**	**Yes- 31 ½"**	**No**
N/A	23119	Signs required for Low Overhead Clearance: Must provide sign if low overhead.	N/A	N/A	N/A	N/A
N/A	23158	Hoistway Floor Numbers: (Inside shaft each hoistway door must have floor numbers 4" tall and within 4" of door opening.)	Yes	Yes	Yes	Yes
2.2		**MACHINE ROOMS AND MACHINERY SPACES**				
2.2.1	n/a	Enclosures – Designated Machine Room (No-non elevator equipment- existing can stay)	Yes	Yes	Yes	Yes
2.2.2	23121	Access to Machine Rooms and Machinery Spaces (A permanent means to the machine room- locked door)	Yes	Yes	Yes	Yes
2.2.3	23122	Lighting (Permanent lighting in all machine rooms) (WAC requires at least 10 FTC if installed before 2004)	Yes	Yes	**No**	Yes
	23123	Service Outlets: Must be grounded	Yes	Yes	Yes	Yes
2.2.4	n/a	Ventilation (Natural or mechanical to avoid overheating)	Yes-natural	Yes - natural	Yes - natural	**No**
2.2.5	23124	Pipes Conveying Gases, Vapors, or liquids (Existing pipes allowed if guarded to prevent discharge)	Yes	Yes	Yes	Yes
2.2.6	23125	Protection From Weather	Yes	Yes	Yes	Yes
	23126	Protective measures: Guarding sheaves and holes into top of hoistway.	Yes	Yes	Yes	Yes
2.3		**PITS**				
2.3.1	23130	Access to Pits (Means of access to all pits. If access door provide closer & keys onsite. Ladders required if over 3' pit)	Yes	Yes	**No**	Yes
2.3.2	23131	Drains (Drains connected directly to the sewer are not permitted.)	Yes	Yes	Yes	Yes
	23132	Pit Lighting (Installations prior to 2004 require at least 5FTC. Also permanent grounded outlet.	Yes	Yes	Yes	Yes
2.3.3		Stop Switch (A stop switch shall be provided for every pit. Locate near access, color, etc.)	Yes	Yes	Yes	Yes
2.1.5	23133	Counterweight Guards (Start at 12" go to 84" above pit floor; not needed with comp rope/chain)	Yes	Yes	Yes	Yes
2.4		**CLEARANCES AND RUNBYS**				
2.4.1		Horizontal Car Clearances (Not more then 5" for horizontal doors; 7.5" for vertical	Yes	Yes	Yes	Yes

A17.3	WAC 296-96		Complies Yes/No			
			Cars 1 & 2	Car 3	Car 4	Car 5
		doors)				
2.4.2		Bottom Car Clearances (Car shall not strike any equipment when resting on fully compressed buffer.)	Yes	Yes	Yes	Yes
2.4.3		Bottom Car and Counterweight Runby (Shall not exceed 24" for cars; or 36" for cwt.)	DNC	DNC	DNC	DNC
2.4.4		Top Car Clearance (Car does not strike any overhead structure)	Yes	Yes	Yes	Yes
2.4.5	23156	Landing Sill Clearance (At least ½" for side guides; at least ¾" for corner guides. Max cannot exceed 1 ½".)	Yes	Yes	Yes	Yes
		PROTECTION OF SPACES BELOW HOISTWAYS				
2.5	23140	Counterweight safeties required	N/A	N/A	N/A	N/A
2.6		**HOISTWAY ENTRANCES**				
2.6.1	23150	Doors or Gates Required (Passenger Elevators – full width/height – no hand latches.) (Freight Elevators – at least 6-0" gate)	Yes	Yes	Yes	Yes
2.6.2	23151	Closing of Hoistway Doors (Door closers required on cars except swinging portion of horizontal door)	Yes	Yes	Yes	Yes
2.6.3	23152	Hoistway Door Vision Panels (Required on manually operated or self closing doors, location, Size, and type of glass)	N/A	N/A	Yes	Yes
2.6.4	23153	Door Hangers (Prevent jumping, and stops, 4 times load)	Yes	Yes	Yes	Yes
2.6.5	23154	Non-Shearing Astragals (For vertical bi-parting doors only)	N/A	N/A	Yes	Yes
2.6.6	23155	Pull Straps (Must not be more than 6'-6" from floor when open)	N/A	N/A	Yes	Yes
	23158	4" floor numbers must be installed on hoistway doors.	Yes	Yes	Yes	Yes
2.7		**HOISTWAY DOOR LOCKING DEVICES, PARKING, DEVICES, AND ACCESS**				
2.7.1	23160	Hoistway Door or Gate Locking Devices (Mechanical and electrical interlocks required)	Yes	Yes	Yes	Yes
2.7.2	23161	Elevator Parking Device (For cars operated from within car only)	N/A	N/A	N/A	N/A
2.7.3	23162	Access to Hoistway (Hoistway door unlocking devices and access switches)(WAC says must be cylinder key)	**No**	**No**	**No**	**No**
2.7.4		Restricted Opening of Hoistway Doors and/or Car Doors on Passenger Elevators (Cannot open more then 4" outside unlocking zone +-18" max.)	DNC	**No**	**No**	**No**
2.7.5		Hoistway Emergency Door Contacts (Positively opened)	N/A	N/A	N/A	N/A
2.8		**POWER OPERATION OF DOORS AND GATES**				
2.8.1		Kinetic Energy and Force Limitations for Power-operated Horizontal Sliding Doors. (Shall not exceed 7ft/lbs. with re-opening device, without 2.5ft/lbs.; cannot exceed 30 ft/lbs)	DNC	Yes	Yes	N/A
2.8.2	23165	Reopening Device for Power-Operated Car Doors or Gates (Can be rendered inoperative if less then 2.5ft/lb)	DNC	Yes	Yes	N/A
	23166	Photo Eyes/Electric Edges: (Must time out after 20 seconds and close the door.)	DNC	**None**	Yes	**None**
		Part III				

Appendix "B"

A17.3, WAC 296-96, & SBC 3011
Code for Existing Traction Elevators

A17.3	WAC 296-96		Complies Yes/No			
			Cars 1 & 2	Car 3	Car 4	Car 5
3.1	23203	Buffers And Bumpers (Car and counterweight buffers are required)	Yes	Yes	Yes	Yes
3.2	23205	Counterweights (The weights shall be protected so that they cannot be dislodged. The rod nuts shall be protected)	Yes	Yes	Yes	Yes
3.3		**CAR FRAMES AND PLATFORMS**				
3.3.1	23206	Car Platforms (Cover entire area)	Yes	Yes	Yes	Yes
3.3.2	23207	Platform Guards (Aprons) (Vertical face at least 21" A17.3, 60-75deg, withstand 150#)	Yes – 21"	Yes – 21"	Yes – 21"	DNC
3.3.3	23208	Hinged Platform Sills (Must have contacts & prevent operation unless within 2")	N/A	N/A	N/A	N/A
3.3.4	23209	Floating (Movable) Platforms (Prohibited if car can move when door is not closed)	N/A	N/A	N/A	N/A
3.3.5	n/a	Protection of Platforms Against Fire (Must be covered with sheet metal or fire resistant material)	DNC	Yes-steel	**No - wood**	DNC
3.4		**CAR ENCLOSURES**				
3.4.1	23215	Car Enclosures (Passenger – total enclosed; Frt maybe perforated, but not by the cwt.; Car top must withstand 300lbs on any 2sqft.)	Yes	Yes	Yes	Yes
	23216	Cab Lining Materials (Must have class 1 rating, flame spread of 25 or less.	Yes	Yes	Yes	Yes
3.4.2	23220	Car Doors and Gates (Must have gate or door and electric contract)	Yes	Yes	Yes	Yes
3.4.3	23221	Location of Car Doors and Gates (Hor, distance not more then 5 ½"., Swing door 4" max., space and site guard requirements.)	Yes	Yes	Yes	Yes
3.4.4	23225	Emergency Exits (Cover hinged, single car blind shaft-every 36', side allowed)	Yes	Yes	Yes	Yes
3.4.5	23226	Car Illumination (At least two lights, 5ftc; frt=2.5ftc; emerg. .2ftc for 4 hrs.)	Yes	Yes	Yes	**No**
3.4.6		Protection of Light Bulbs and Tubes (Guarded or coated to prevent breaks)	Yes	Yes	**No**	**No**
3.5		**SAFTIES**				
3.5.1	23227	Car Safeties (Every car must have a safety)	Yes	Yes	Yes	Yes
3.5.2		Counterweight Safeties (If occupied space below)	N/A	N/A	N/A	N/A
3.5.3		Safeties to Stop Ascending Cars or Counterweights Prohibited (Cannot be provided)	N/A	N/A	N/A	N/A
3.5.4		Application and Release of Safeties (Must be mechanical can only release if car goes up)	Yes	Yes	Yes	Yes
3.5.5	23228	Max. Permissible Movement of Gov. Rope to Oper. Safety (For type "B" Safties-200ft or less 42in.; 201 to 375fpm – 36in.; Over 375 FPM 30in. Cwt. = 42in all speeds.)	Yes	Yes	Yes	Yes
3.5.6	23229	Rail Lubricants and Lubrication Plate (Plate on cross head stating type of lubricant or none at all.)	Yes	Yes	Yes	Yes
3.5.7		Overall Length of Guide Rails (Extended to prevent disengaging)	Yes	Yes	Yes	Yes
3.6		**SPEED GOVERNORS**				
3.6.1	23235 / 23236	Speed Governor Overspeed and Car Safety Mechanism Switches. (A switch shall be provided when speed is over 150FPM. For static control switch shall be for all speeds & both direct.)	Yes	Yes	Yes	Yes
3.6.2		Governor Ropes (Shall be of iron, steel, monel metal, phosphor bronze, or ss. At least 3/8" in diameter Tiller rope not allowed.)	Yes	Yes	Yes	Yes

Appendix "B"

A17.3, WAC 296-96, & SBC 3011

Code for Existing Traction Elevators

A17.3	WAC 296-96		Complies Yes/No			
			Cars 1 & 2	Car 3	Car 4	Car 5
3.7		**CAPACITY AND LOADING**				
3.7.1	23240	Minimum Rated Load for Passenger Elevators (per table 3.7.1)	Yes	Yes	N/A	N/A
3.7.2	23241	Use of Partitions for Reducing Inside Net Platform Area (Partitions must be permanent and symmetrical)	N/A	N/A	N/A	N/A
3.7.3	23243	Min. Rated Load for Freight Elevators (Class A = Not more then ¼ of total cap.; Class B = Motor Veh.; Class C = loading with industrial truck, etc.)	N/A	N/A	Yes	Yes
3.7.4	23244	Capacity Plates (Every car must have one with rated load; Frt : one piece loads, loading and unloading; ¼" high for pass, 1" for frt.)	Yes	Yes	Yes	Yes
3.7.5	23245	Signs on Freight Elevators (NOT A PASS ELEV…etc. ½" high letters)	N/A	N/A	**No**	**No**
3.8		**DRIVING MACHINES AND SHEAVES**				
3.8.1	23250	General Requirements (Must be cast iron or steel, fin. Grooves no set screws)	Yes	Yes	Yes	Yes
3.8.2	23255	Winding Drum Machines (Must have slack rope switch; Chain, belt, or rope-driven mechanisms shall not be used.)	N/A	N/A	N/A	N/A
3.8.3	23256	Indirect-Drive Machines(Must be at least 3 belts, safety factor of 10)	N/A	N/A	N/A	N/A
3.8.4	23260	Brakes (Must be released electrically and have spring or gravity and friction)	Yes	Yes	Yes	Yes
3.9		**TERMINAL STOPPING DEVICES**				
3.9.1	23262	Normal and Terminal Stopping Devices (Locate at upper and lower terminals. If in machine room provide broken rope, tape or chain switch)	Yes	Yes	Yes	Yes
3.9.2	23264	Final Terminal Stopping Devices (Winding drum machines- on machines and in hoistway; Traction – in the hoistway operated by the car.)	Yes	Yes	Yes	Yes
3.10		**OPERATING DEVICES AND CONTROL EQUIP.**				
3.10.1	23266	Types of Operating Devices (Rope or rod devices shall not be used.)	Yes	Yes	Yes	Yes
3.10.2	23268	Car-Switch Operation Elevators (If provided must return to stop position if released by hand)	N/A	N/A	N/A	N/A
3.10.3	23270	Top-of-Car Operating Devices (Continuous pressure <150FPM; bet. Crosshead/door.	Yes	Yes	Yes	Yes
3.10.4	23272	Electrical Provisions				
		(a) Slack Rope Switch	N/A	N/A	N/A	N/A
		(b) Motor-Generator Running Switch	N/A	N/A	Yes	N/A
		(c) Compensating Rope Sheave Switch	N/A	N/A	N/A	N/A
		(d) Broken rope, tape or chain	Yes	Yes	Yes	Yes
		(e) Stop Switch – Top of Car- marked "stop" & "run"	Yes	Yes	Yes	Yes
		(f) Car-Safety Mechanism Switch	Yes	Yes	Yes	Yes
		(g) Speed Gov. Overspeed Switch	Yes	Yes	Yes	Yes
		(h) Final Terminal Stopping Devices	Yes	Yes	Yes	Yes
		(i) Emergency Terminal Stopping Devices (reduced stroke)	N/A	N/A	N/A	N/A
		(j) Motor Generator Overspeed Protection	N/A	N/A	Yes	N/A
		(k) Motor Field Sensing Means (not required w/ static drive)	Yes	Yes	Yes	Yes
		(m) Buffer Switches for Oil Buffers (type c safety)	N/A	N/A	N/A	N/A

Appendix "B"

A17.3, WAC 296-96, & SBC 3011

Code for Existing Traction Elevators

A17.3	WAC 296-96		Complies Yes/No			
			Cars 1 & 2	Car 3	Car 4	Car 5
		(n) Hoistway Door Interlocks or Hoistway Door Contacts	Yes	Yes	Yes	Yes
		(p) Car Door or Gate Electric Contacts	Yes	Yes	Yes	Yes
		(q) Normal Terminal Stopping Devices	Yes	Yes	Yes	Yes
		(r) Car Side Emergency Exit Electric Contact	N/A	N/A	N/A	N/A
		(s) Electric Contacts for Hinged Car Platform Sills	N/A	N/A	N/A	N/A
	23269	(t) In-Car Stop Switch (Must be keyed, if provided)(WAC does not require)	Yes-Keyed	**No- not keyed**	**No- not keyed**	**No- not keyed**
		(u) Emergency Stop Switch (Must be provided for freight cars)	N/A	N/A	N/A	N/A
		(v) Stop Switch in Pit	Yes	Yes	Yes	Yes
		(w) Buffer Switches for Gas Spring Return Oil Buffers	N/A	N/A	N/A	N/A
3.10.5	23274	Power Supply Line Disconnecting Means (Provided w/ overcurrent protection, within site, and numbered)	Yes	Yes	Yes	Yes
3.10.6	23276	Phase Reversal and Failure Protection (Means to prevent starting if out of phase)	Yes	Yes	Yes	Yes
3.10.7		Devices for Making Hoistway Door Interlocks or Electric Contacts, or Car Door or Gate Electric Contacts Inoperative (These devices are prohibited)	Yes	Yes	Yes	Yes
3.10.8		Release and Application of Driving Machine Brakes (If ungrounded or if stop switch is pulled shall release brake)	Yes	Yes	Yes	Yes
3.10.9	23222	Control and Operating Circuit Requirements (The failure of any single magnetically operated switch)	Yes	Yes	Yes	Yes
	23277	Grounding and Overcurrent: Must comply with 620-61	Yes	Yes	Yes	Yes
3.10.10	23278	Absorption of Regenerated Power (Provide means to absorb energy during overhauling)	Yes	Yes	Yes	Yes
3.11		**EMERGENCY OPERATION AND SIGNALING DEVICES**				
3.11.1	23280	Car Emergency Signaling Devices (Audible signal, two-way communication, on emerg. power)	Yes	Yes	Yes	Yes
3.11.2		Operations of Elevators Under Standby (Emergency) Power (If provided must be able to absorb regenerative power)	N/A	N/A	N/A	N/A
3.11.3		Firefighters' Service(A17.1-1987 Rules 211.3 through 211.8- appendix C; phase I and II switches shall be the same in each bldg)	Yes	**No**	**No**	**No**
3.12		**SUSPENSION MEANS/CONNECTIONS**				
3.12.1	23282	Suspension Means (Must be wire rope made of iron or steel- Elevator ropes only)	Yes	Yes	Yes	Yes
3.12.2	23283	Rope Data Tag (Diameter, rated breaking strength, the grade of material, the month/year, preformed or non, construction classification, name of person or firm, name of rope manufacture, no. of ropes, the date resocketed, height of letters shall be 1/16".	DNC	**No**	Yes	DNC
3.12.3	23284	Factor of Safety(f = SxN/W or table 3.12.3)	Yes	Yes	Yes	Yes
3.12.4	23285	Minimum Number and Diameter of Suspension Ropes (3 for traction; 2 for drum; minimum diameter = 3/8")	Yes	Yes	Yes	Yes
3.12.5	23287	Suspension Rope Equalizers (When provided shall be of the individual-compression spring type)	Yes	Yes	Yes	Yes

Appendix "B"

A17.3, WAC 296-96, & SBC 3011

Code for Existing Traction Elevators

A17.3	WAC 296-96		Complies Yes/No			
			Cars 1 & 2	Car 3	Car 4	Car 5
3.12.6	23288	Securing of Suspension Wire Ropes to Winding Drums (rope must be secured by clamps or tapered babbitted sockets.)	N/A	N/A	N/A	N/A
3.12.7	23289	Spare Turns on Winding Drums	N/A	N/A	N/A	N/A
3.12.8	23290	Suspension Rope Fastenings(Spliced eyes by return loop)	Yes	Yes	Yes	Yes
3.12.9	23291	Auxiliary Rope Fastening Devices	N/A	N/A	N/A	N/A

3011	**Seattle Building Code Chapter 30:Retroactive Requirements for Existing Installations**	**Complies/Comments**			
3011.1	General: Shall comply with WAC 296-95	See above	See above	See above	See above
3011.2	Doors to Elevator and Dumbwaiter Machine Rooms. Must be self-closing and self-locking.	Yes	Yes	Yes	Yes
3011.3	Key Retainer Box. A key retainer box locked keyed to the standard City access key for elevator access and keys shall be provided and meet the following:	Yes	Yes	Yes	**No**
	1) 8" high x 6" wide x 1" deep.	Yes	Yes	Yes	-
	2) Material – 16 gauge steel welded.	Yes	Yes	Yes	-
	3) Color – red (unless located in the main lobby above the hall call button, six feet nominal above the floor)	Yes	Yes	Yes	-
	4) Labeling – "FOR FIRE DEPARTMENT USE"	Yes	Yes	Yes	-
	5) Lock – Ace one-inch cylinder cam lock key #39504	**No**	**No**	**No**	-
	6) The box shall be located adjacent to the phase I key, and 6'-0" above the floor, or other location if approved by SBC.	Yes	Yes	Yes	-
3011.4	Elevator Access Keys: The following keys shall be retained in the above mentioned key box:	Yes	Yes	Yes	-
	1) Machine room door	Yes	Yes	Yes	-
	2) Secondary level door	-	-	-	-
	3) Pit door	Yes	Yes	Yes	-
	4) Roof door	-	-	-	-
	5) Independent, hospital emergency and/or attendant operation	-	-	-	-
	6) Hoistway Access	Yes	Yes	Yes	-
	7) Mechanical Hoistway Access devices (broken are, lunar key, etc.)	Yes	Yes	Yes	-
	8) Miscellaneous keys	-	-	-	-
	9) Fire alarm panel room	-	-	-	-
	10) Sprinkler valve control room	-	-	-	-
	11) Phase I and phase II key switches, one for each type)	Yes	-	-	-
3011.5	Dumbwaiter Machinery Access. Must have electric contacts and sign on door saying " DANGER – DUMWAITER MACHINE". 1" letters.	N/A	N/A	N/A	N/A
3011.6	Machine space lighting. Lighting of the machine rooms shall comply with ASME A17.1, Rule 101.5a as amended below: 101.5a Lighting: Permanent electric lighting shall be provided in all machine rooms and machinery spaces. The illumination shall be not less than 10ftc (108lux) at the floor	Yes	Yes	**No**	Yes

	level. The lighting control switch shall be located within easy reach of the access to such rooms or spaces. Where practicable, the light control switch shall be located on the lock jamb side of the access door. Where practical, elevator; its and machine rooms shall be provided with an electrical outlet.				
3011.7	Access to Terminal Landings. Mechanical access to terminal landings of elevator hoistways shall be provided in accordance with ASME A17.1, Rule 111.9(e) or WAC 296-95-162(1).	Yes	Yes	Yes	Yes
3011.8	Wall Covering Material for Passenger Cars. Wall covering material for passenger cars shall comply with the following: 1. ASME A17.1, Rule 204.2a, as amended by the following: 1.1 SBC regulations concerning flame spread ratings for wall coverings and use of plastics (see chapters 7 &8) 1.2 WAC 296-95-216 except that interior finish materials, need not be firmly bonded flat to the enclosure and may be padded.	Yes	Yes	Yes	Yes
3011.9	Control and Operating Circuits and Overcurrent Protection. Control and operating circuit requirements shall comply with ASME A17.1 Rules 209.3c, 210.9 and 306.9. Overcurrent protection shall be maintained in accordance with Article 620-61, Electrical Code.	Yes	Yes	Yes	Yes
3011.9.1.2	Hydraulic Elevators	N/A	N/A	N/A	N/A
3011.10	Roped Hydraulic Elevators. Roped horizontal hydraulic elevators may continue in service but once taken out of service may not be reactivated.	N/A	N/A	N/A	N/A
3011.11	Pit Access and Equipment. Access ladders shall be installed in elevator pits deeper than 3 feet. Pits shall be illuminated in compliance with ASME A17.1, Rule 106.1e, items 1 and 2. Pit light control switches shall be located inside the hoistway of every elevator approximately 48 inches above the threshold, and either within 18 inches of the access door or within reach from the access floor and adjacent to the pit ladder. Access shall be provided for safe maintenance and inspection of all equipment located in the pit.	DNC	Yes	Yes-**No guard and light switch on wrong side**	Yes
3011.12	Floor Numbers. Elevator hoistways shall have floor numbers, not less then 2 inches in height, placed on the walls and/or doors of hoistways at intervals such that a person in a stalled elevator upon opening the car door could determine the floor position.	DNC	DNC	DNC	DNC
3011.13	Car To Work Light. A permanently wired work light and outlet shall be installed on top for freight and passenger elevators to provide adequate illumination for inspection and work in the hoistway. The light shall be provided with a non-keyed switch in or adjacent to the fixture. The fixture shall be protected from accidental breakage.	DNC	Yes- **No guards**	Yes- **No guards**	Yes- **No guards**
3011.14	Labeling. All equipment (disconnect switches, machines and controllers) operating on a voltage in access of 250 volts shall be labeled for the voltage used in letters ¾" high.	Yes	Yes	Yes	Yes
3011.15	Interior Alterations. Alterations or modifications of elevator car interiors shall comply with ASME A17.1, Rule 1202.4b (increase in dead weight of car), Building Code requirements concerning flame spread ratings for wall	Yes	Yes	Yes	Yes

	coverings [see chapter 8], and lighting requirements of ASME A17.1.				
3011.16	Illumination. Illumination in the elevator car shall be maintained unless it is turned off manually by the switch in the car. A readily-accessible and labeled toggle-type test switch shall be provided on the top of the car to cut lighting power manually and test the emergency lighting.	Yes	Yes	Yes	**No**
3011.17	Conveyance Number Designation. In any building with more than one elevator, escalator or other type of conveyance a designating number (not less than two inches in height) shall be located at the door of the main entrance lobby, inside the car, on the machine, on the disconnect switch or stop switch, and on escalator upper and lower front plates.	Yes	Yes	Yes	Yes
3011.18	Escalator Starting Switches. "Up" and "Down" positions shall be clearly indicated on all starting switches.	N/A	N/A	N/A	N/A
3011.19	Anchorage for Elevator Equipment. All elevator equipment, hydraulic or cable type shall be anchored.	Yes	**No**	**No**	**No**
3011.20	Restricted Opening of Doors. All existing passenger elevators in Group R, Division 1 hotels and dormitory buildings shall comply with the requirements of ASME A17.1, Rule 111.12.	DNC	**No**	**No**	**No**
3011.21					

Appendix C

Performance Review and Maintenance Deficiency List

	PERFORMANCE TIMES	*Design cars 1 & 2*	Car 1	Car 2	*Design Car 3*	Car 3	*Design Car 4*	Car 4
7.1	Door Open Time	**1.6**	-	-	**1.6**	**2.3**	-	11.8
7.2	Door Close Time	**2.4**	-	-	**2.4**	**6.2**	-	7.9
7.3	Floor to Floor Up	**10.0**	-	-	**12.0**	-	-	-
7.4	Floor to Floor Down	**10.0**	-	-	**12.0**	-	-	-
7.5	Full Speed Up (FPM)	**200**	-	-	**100**	-	**200**	-
7.6	Full Speed Down (FPM)	**200**	-	-	**100**	-	**200**	-
7.7	Jerk Rate Up	**4.5**	-	-	**4.5**	-	**4.5**	-
7.8	Jerk Rate Down	**5.6**	-	-	**5.6**	-	**5.6**	-
7.9	Power Closing of Door (Pressure Gauge)	**<25 lbs**	-	-	**<25 lbs**	26lbs	**<25 lbs**	-
7.10	Interrupted Ray	**.5sec**	-	-	**.5sec**	-	**.5sec**	-
7.11	Car Dwell Time	**3.0**	-	-	**3.0**	5.7	**3.0**	-
7.12	Hall Call Dwell Time	**5.0**	-	-	**5.0**	4.5	**5.0**	-
7.13	Hall Lantern Time	**7.0**	-	-	**7.0**	-	**7.0**	-
7.14	Nudging	**20.0**	-	-	**20.0**	-	**20.0**	-
7.15	Test Phone (Works)	**Y/N**	DNC	DNC	**Y/N**	No	**Y/N**	No
7.16	Test Emergency Light (Works)	**Y/N**	DNC	DNC	**Y/N**	DNC	**Y/N**	DNC

(1) Most items were not recorded because Cars 1 and 2 were shut off and Cars 3-5 were not running when in the machine room.

Items in Red do not comply and should be adjusted. DNT = Did Not Test.

Car #	GENERAL MAINTENANCE DEFICIENCIES	COMPLETED	DATE CHECKED
Car 1			
1.1	Not in operation at the time of the survey		
Car 2			
2.1	Not in operation at the time of the survey		
Car 3			
3.1	Pit access locked with pad lock and survey mounted hasp with key hanging on hook adjacent to hoistway doors		
3.2	No car to railings with areas greater than 12” – required by SBC		
3.3	Hoistway door sills are very dirty		
3.4	Five year inspection tag missing but entered as current in log		
3.5	No photo eye or electric edge- only mechanical edge		
3.6	No emergency light installed inside car		

Appendix C

Performance Review and Maintenance Deficiency List

Car #	GENERAL MAINTENANCE DEFICIENCIES	COMPLETED	DATE CHECKED
3.7	No guards on car top light		
3.8	Door operation is poor- very dirty – door gets stuck at 1st floor		
3.9	Hoistway door operation is very rough		
3.10	Door open and close times are very slow		
3.11	Hall dwell time needs to be 5.0 seconds minimum to comply with ADA		
3.12	Emergency phone was inoperative- did not call out		
Car 4			
4.1	Freight car signs per SBC and WAC codes missing		
4.2	Pit light is not bright enough and unguarded		
4.3	Pit light switch is not on the ladder side		
4.4	Emergency phone was inoperative-did not call out		
4.5	Car top rails are too short- should be 42” high		
4.6	No guards on machine room or in-car lights		
4.7	Machine room light was inoperative-possible burned out light bulb		
4.8	Unguarded electrical power in the machine room		
4.9	Emergency phone was inoperative- did not call out		
Car 5			
5.1	Car top light burned out- inoperative		
5.2	No keys to hoistway access		
5.3	Freight car signs per SBC and WAC codes missing		
5.4	Emergency phone was inoperative- did not call out		